Dr. Amir Natan - Curriculum Vitae

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Year of birth: 1966
Martial status: married + 1

Email Address: amirnatan@post.tau.ac.il

2011 – Senior lecturer, Department of Physical Electronics, Faculty of Engineering, Tel-Aviv University.

Research Interests:

- Physical properties of biological and artificial systems from atomic to macroscopic scale.
- Multi-Scale simulations and phenomenological description of molecular electronic devices.
- Scattering and electron transport phenomena at interfaces.
- Interaction of light with matter
- Computational and theoretical strategies for large scale ab-initio and molecular dynamics (MD) calculations.

Academic history:

2010-2011 – Post-doc in the group of Prof. Tamar Seideman at Northwestern University. Theory of non-linear response of molecules to short laser pulses. Theoretical research of modified graphene.

2006-2010 – PhD at the Weizmann institute. Thesis "Understanding collective effects at organic/inorganic interfaces from first principles", supervised by Prof. L. Kronik and Prof. D. Cahen.

2003-2005 – M.Sc. in Electronics and Electrical Engineering (Cum Laude) from the Tel-Aviv University. Thesis: "Adsorption of benzene derivative self assembled monolayers on silicon surfaces: A first principles study", advised by Prof. Y. Shapira and Dr. L. Kronik

1984-1987 – B.Sc. in Physics and Mathematics, (Cum Laude) from the Hebrew University, this was done in the frame of the IDF's "Talpiot" elite academic program. In addition – I studied 10 courses in Biology and Biochemistry.

Professional history:

2003-2004 – Consultant for BrainsGate Ltd. - a company producing a medical device for the delivery of drugs across the blood-brain barrier.

1992-1999 – Co-founder and President (1994-1997) of Compugen Ltd. (http://www.cgen.com, Nasdaq:cgen) together with 2 partners. The company was of

the pioneers of Bioinformatics in Israel and developed and sold hardware, software and algorithms to assist in the research of the Human Genome project.

1989-1992 – In the Israeli Air industries on behalf of the Israeli Navy. Signal processing consulting and algorithm development for a large scale project.

1987-1988 – In Rafael on behalf of the Israeli Navy.

Other Activities:

2006, 2009 – Teaching assistance - "Solid State Physics for chemists", Weizmann institute.
2008 – Initiated a new guided reading course "materials for renewable energy".
2008 – Co-organized a Minerva Israeli-German student conference "Molecules as sensors".
2004-2006 – Voluntary work in guiding student teams that perform organizational consulting for non-profit organizations.
2000-2002 – Additional studies that included acting, dancing, massage therapy, psychotherapy and meditation.

Languages: Hebrew (mother tongue), English (Fluent).

Computer Languages and tools: C, C++, Fortran95, Assembly of several processors, PERL, Matlab and Mathematica.

Publications:

1. *Amir Natan, Yigal Zidon, Yoram Shapira, and Leeor Kronik,* "Cooperative effects and dipole formation at semiconductor/self-assembled-monolayer interfaces", Phys. Rev. B **73** 193310 (2006).

2. *Amir Natan, Leeor Kronik and Yoram Shapira*, "Computing surface dipoles and potentials of self-assembled monolayers from first principles", Applied Surface Science, **252,** 7608 (2006)

3. *Rachel Gueta*, Amir Natan*, Lia Addadi, Steve Weiner, Keith Refson, and Leeor Kronik,* "Local atomic order and infrared spectra of biogenic calcite", Angewandte Chemie Int'l Edition, **46**, 291-294 (2007). *Equal contribution authors.

4. *Lior Segev, Adi Salomon, Amir Natan, David Cahen, Leeor Kronik, Fabrice Amy, Calvin K. Chan, and Antoine Kahn, "*Electronic structure of Si(111)-bound alkyl monolayers: Theory and experiment", Phys. Rev. B. **74**, 165323 (2006).

5. *Rachela Popovtzer, Amir Natan, Yosi Shacham-Diamand,* "Modeling of Whole Cell Electrochemical Biosensor for Water Toxicity Detection", Journal of Electroanalytical Chemistry **206**, 17 (2007).

6. *Dudi Deutsch, Amir Natan, Yoram Shapira, and Leeor Kronik,* "Electrostatic properties of adsorbed polar molecules: Opposite behavior of a single molecule and a molecular monolayer", J. Am. Chem. Soc. **129**, 2989 (2007).

7. *Amir Natan, Leeor Kronik, Hossam Haick, and Raymond Tung*, "Electrostatic properties of ideal and non-ideal polar organic monolayers: implications for electronic devices", Adv. Mat. **19**, *4103-4117,* (2007) – An invited progress report.

8. *Amir Natan, Ayelet Benjamini, Doron Naveh, Leeor Kronik, Murilo L. Tiago, Scott P. Beckman,and James R. Chelikowsky,* "Real Space Pseudopotential method for first principles calculations of general periodic and partially periodic systems", Phys. Rev. B **78**, 075109 (2008).

9. *Eyal Capua, Amir Natan, Leeor Kronik, and Ron Naaman*, "The Molecularly Controlled Semiconductor Resistor: How does it work?", Appl. Mater. Interfaces, **1** (11), pp 2679–2683 (2009).

10. *Amir Natan, Natalia Kuritz, and Leeor Kronik*, "Polarizability, susceptibility, and dielectric constant of nano-scale molecular films: a microscopic view" – Adv. Func. Mater. **20**, 2077–2084 (2010).

11**.** *Ferdinand Rissner, David A. Egger, Amir Natan, Thomas Körzdörfer, Stephan Kümmel, Leeor Kronik, and Egbert Zojer*, "Collectively Induced Quantum-Confined Stark Effect in Monolayers of Molecules Consisting of Polar Repeating Units", JACS **133**, 18634-18645 (2011).

12. *Ferdinand Rissner, Amir Natan, David A. Egger, Oliver T. Hofmann, Leeor Kronik and Egbert Zojer*, "Dimensionality effects in the electronic structure of organic semiconductors consisting of polar repeat units", Organic Electronics, in press.

13. *Viktor Ariel and Amir Natan*, "Electron Effective mass in Graphene", arXiv:1206.6100